

the  
advanced,  
new  
**Engineering and Electroforming  
facilities of**

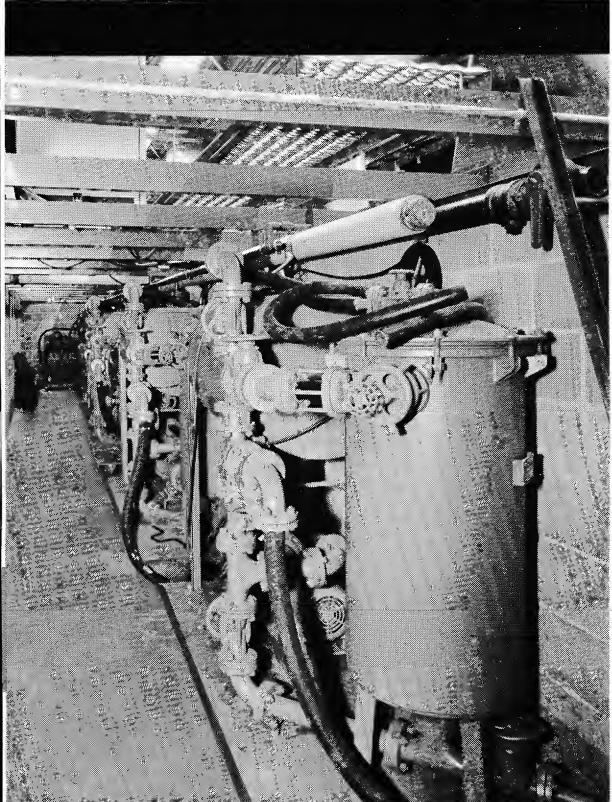
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**GAR**

**PRECISION PRODUCTS, INC.**



A SUBSIDIARY OF HELI-COIL CORPORATION • DANBURY, CONN.



#### ELECTROFORMING PRODUCTION SHOP

maintained in a high state of cleanliness and provided with *filtered air ventilation* to insure clean and flawless electroformed products, free from imperfections caused by dust contamination or other foreign matter. Battery of baths at left is for copper electroforming; at right for nickel electroforming.

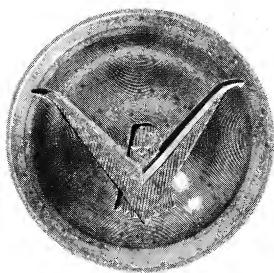
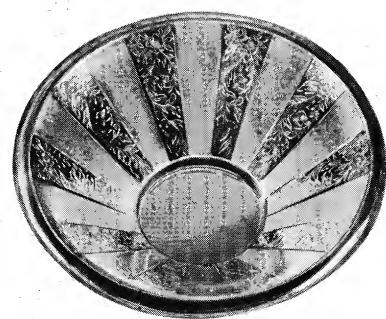
This new equipment features positive individual current control, automatic temperature controls and air agitation of electrolytes, plus "gandy dancers" — specially designed cathode agitators — to insure uniformity of thickness and enhance "throwing power" to increase cathode efficiency. Periodic reverse plating equipment insures ultra fine-grained copper deposits.

**HIGH CAPACITY FILTERS** utilized for each tank permit constant filtration of all production electroforming baths. Soluble impurities are removed by constant electrolyte purification.

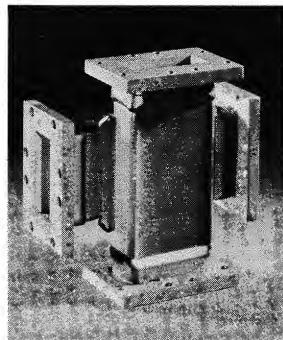
**FOUNDED IN 1950**, and since 1962 a subsidiary of Heli-Coil Corporation, GAR Precision Products, Inc., by virtue of its GAR Electroforming techniques, has established a position of leadership in electroforming to highest Military and Commercial Standards.

The move by the Company in 1963 to its new, specially designed plant in Danbury has vastly expanded its research, engineering and manufacturing capacity to serve customers in the industrial, commercial and military fields with an ever-widening range of high quality products at low cost.

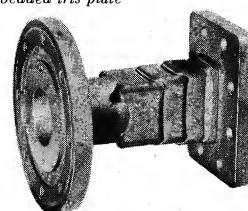
Engraved Hollow Ware Bowl  
Nickel Electroform,  
ready for silver plating



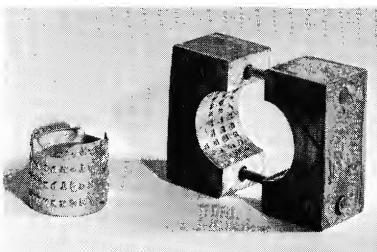
Electroformed Nickel  
Embossing Die for  
impressing design in  
plastic automotive trim



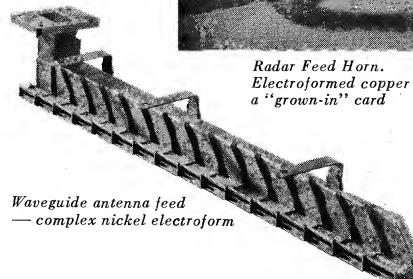
Wave guide coupler  
with aluminum flanges  
"grown-on" nickel body with  
imbedded iris plate



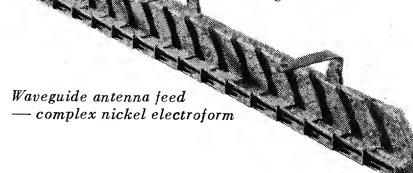
Electroformed copper wave guide  
transition with  
"grown-on" brass flanges



Nickel electroformed  
lightweight type wheel,  
with master



Radar Feed Horn.  
Electroformed copper incorporating  
a "grown-in" card



Waveguide antenna feed  
— complex nickel electroform



Decorative nickel  
electroformed wall switch plate,  
ready for final trim  
and silver plating

**GAR ELECTROFORMING** is a highly developed art and coordinated electrolytic process for quantity production of:

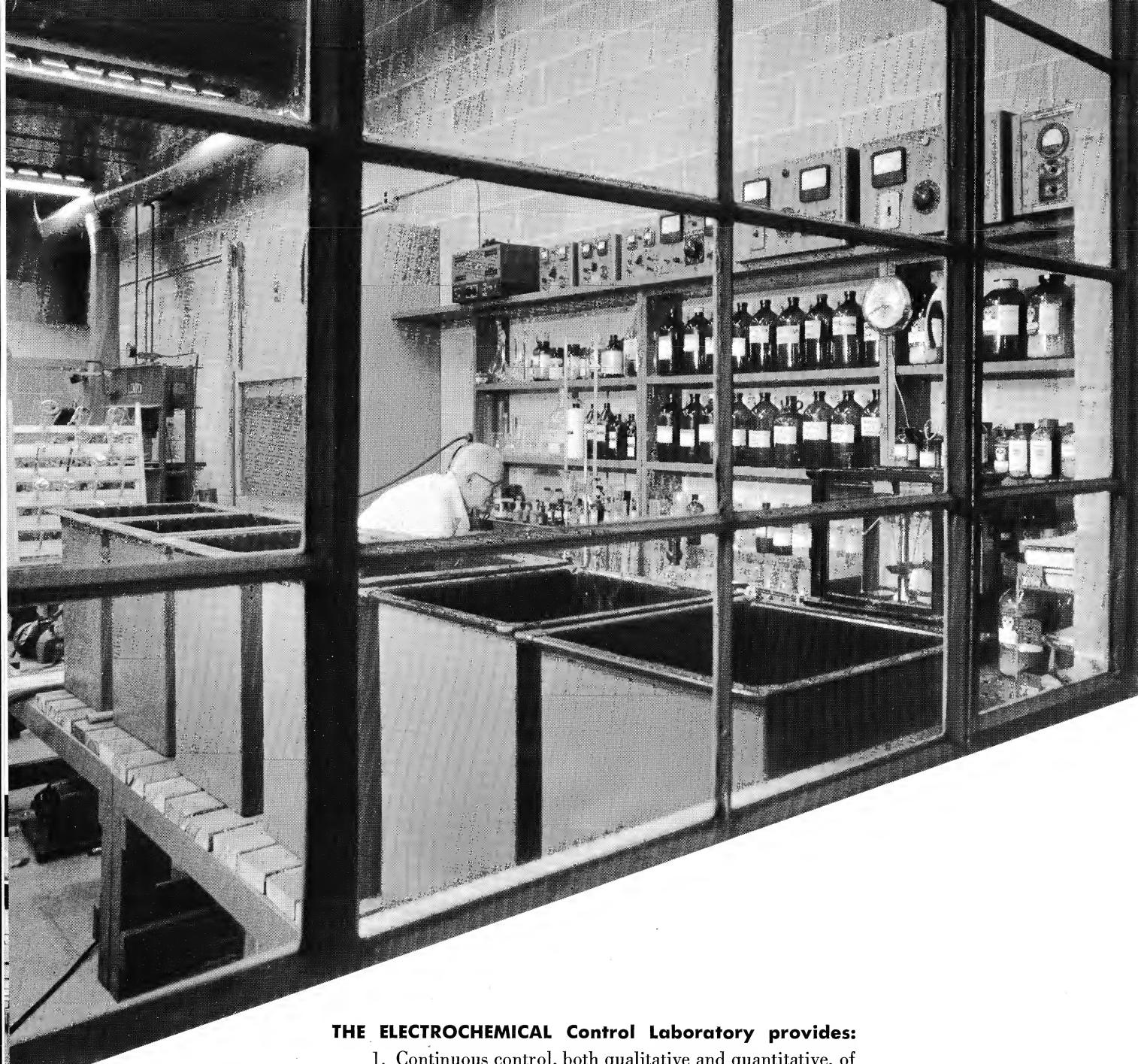
1. Internally shaped, fully dimensioned parts to extreme accuracies.
2. Parts in other forms (flat, concave, convex, etc.) which require accurate, detailed finishing on one side only.

Just as ordinary electroforming represents an extension of electroplating, so GAR electroforming techniques represent a further perfection of the capabilities of electroforming to the point where the only thing in common is the utilization of electric current flow through an electrolyte to produce a build-up of metal by electrodeposition.

In producing a part by the GAR Electroforming Process, a core or mandrel is usually used to establish the inside shape, dimension and finish of the

part. The desired metal for the part is then electro-deposited — atom by atom — on the mandrel to duplicate, to the minutest detail, the form and finish established by the mandrel. When the part has been built up to the required thickness the mandrel is removed. Where part shape does not permit withdrawing the mandrel from the finished part, expendable mandrels are used which can be melted or dissolved out of the interior of the part.

Today, GAR Electroforming techniques are being used in, but not confined to, the quantity production of wave guides, electrical and electronic components and other critical internally configured parts. They are also being employed in totally new fields: commercially produced products such as silver-plated hollow ware and ornamental wall-switch plates; embossing dies and textured molds; as tooling for the production of automotive plastic trim and floor tiles; and electrodes for EDM machines, etc.



**THE ELECTROCHEMICAL Control Laboratory provides:**

1. Continuous control, both qualitative and quantitative, of all electrolytes in the tanks for conformity to GAR's specialized formulations, so as to maintain hardness and stress characteristics of the electroforms at specified levels;
2. Tank facilities, as shown, for pilot runs on new mandrels, masters, and matrices and special electrolyte formulations, as they may be required.

## **ENGINEERING AND DESIGN**

Because most manufacturers are still unfamiliar with the full capabilities of GAR Electroforming, as it may be applied in the money-saving production of an almost infinite variety of industrial and commercial products, GAR Precision Products, Inc. offers you the services of these trained design and production engineers.

Their services are available for the asking and include consultation with your own design and production people, where desired, in achieving part, or complete, product designs which meet your performance requirements most suitably and which, at the same time, offer the most effective use of the low-cost, efficient production advantages inherent in the GAR Electroforming techniques.





**The PRECISION MACHINE SHOP**, equipped with the most modern tools serves two basic purposes:

1. To prepare electroforming masters and mandrels, in a variety of materials to your specifications. In addition, and of great importance, to provide the technical ingenuity and know-how required to prepare mandrels which permit the use of "grow-ins" and "grow-ons", such as flanges, bosses, septums, etc., to achieve an integrated finished product and eliminate the need for brazing or other finishing operations, which would distort the extremely close tolerances achieved by electroforming.
2. To carry the manufacture of your products from drawings to completion, including machining or trimming when outside dimensions must be closely related to inside dimensions of a part and surface finish of part exteriors is critical.

## **QUALITY CONTROL and INSPECTION**

The continuous functions of the technicians in this laboratory are to insure that GAR electroformed parts meet the specifications and performance standards of the world's most exacting customers.

These customers include: Airborne Instruments Laboratory, The Armed Services (all branches), Avco Corporation, Bell Telephone Laboratories, Inc., Bendix Corporation, Brookhaven National Laboratories, General Electric Company, General Motors Corporation, The B. F. Goodrich Company, International Silver Co., Martin Co., Melpar,

Inc., Miter Corp., National Floor Products Co., Inc., Ohio Rubber Co., Proctor & Gamble Co., Radio Corporation of America, Raytheon Co., Sperry Rand Corporation, Sylvania Electric Products, Inc., U. S. Rubber Company, Western Electric Co., Westinghouse Electric Corp., and many others.

Facilities include equipment for hardness testing, air gaging, chemical analysis, precision surface finish measurement, and complete tooling for precise mechanical measurement.



# The many unique advantages of GAR Electroforming

Whether you produce products for industrial use, for sale to the general public, or for military applications, GAR Electroforming not only offers the unique advantages detailed below, but makes feasible quantity production of desired products that other methods cannot duplicate, at the price, or at all.

#### **HIGHEST PRECISION —**

to tolerances unattainable by any other method.

#### **EXACT DUPLICATION —**

the ability to duplicate or reproduce existing parts, or new designs, in unlimited quantities, with no measurable loss in detail.

#### **COMPLEX INTERNAL SHAPES —**

to dimensional tolerances, surface finishes, and complex configurations beyond the capability of other methods.

#### **SURFACE FINISH —**

ability to reproduce exactly surface finishes from the most highly textured to the most highly reflective optical surfaces.

#### **INTRICATE SURFACE DETAIL —**

where exact reproduction of intricate, delicate surface pattern is required.

#### **THIN WALL PARTS —**

where forming by other methods is costly, difficult, or impossible because of insufficient part material to withstand machining, spinning, etc.

#### **METALLIC PURITY —**

where high density and freedom from contamination in part material is important.

#### **PROTOTYPE WORK —**

where initial setup and modification costs render other methods uneconomical or where precisely identical parts are required — or where larger than model shop quantities of experimental parts are needed.

#### **PRODUCTION FLEXIBILITY —**

where production rates must be quickly and economically expanded or where repeated modifications are anticipated.

#### *At your service.*

*To enable you to evaluate the full advantages of  
GAR Electroforming methods  
in producing your high quality products at low cost,  
we offer complete engineering and quotation assistance, without obligation.  
This service is available through GAR representatives  
in principal industrial centers throughout the country  
or direct from our main office, noted below.*

**GAR**

## PRECISION PRODUCTS, INC.

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